

CLAIMS

1. Ophthalmic lens consisting of a substrate made of organic glass, of an abrasion-resistant coating, of a layer of impact-resistant primer and of an inorganic anti-reflective coating, characterized in that the surface of the said substrate is covered with the abrasion-resistant coating and in that the impact-resistant primer layer is inserted between the said abrasion-resistant layer and the anti-reflective coating.

5 2. Lens according to claim 1, wherein the substrate is chosen from:

10 (I) the glasses obtained by polymerization of diethylene glycol bis(allyl carbonate);

15 (II) the glasses obtained by polymerization of acrylic monomers derived from bisphenol A;

15 (III) the glasses obtained by polymerization of allyl monomers derived from bisphenol A.

3. Lens according to claim 1, wherein the substrate is chosen from:

20 (A) the glasses obtained from poly(methyl methacrylate);

(B) the glasses obtained from polystyrene resin;

(C) the glasses made of resin based on diallyl phthalate.

4. Lens according to claim 1, wherein the impact-resistant interlayer has an intrinsic Bayer value lower than or equal to 2, at a thickness of 3 μm .

25 5. Lens according to claim 1, wherein the impact-resistant primer is a thermoplastic or heat-curable polymer composition which has a solids content ranging from 5 to 20% by weight relative to the total weight of the primer composition.

30 6. Lens according to claim 1, wherein the thickness of the impact-resistant interlayer in the cured state is between 0.2 and 1 μm .

7. Lens according to claim 1, wherein the composition of the impact-resistant primer consists of a thermoplastic polyurethane resin obtained by reaction of a diisocyanate with a compound comprising a reactive hydrogen at each end.

8. Lens according to claim 1, wherein the composition of the impact-resistant primer consists of a heat-curable polyurethane resin obtained by reaction of a blocked polyisocyanate and of a polyol.

5 9. Lens according to claim 1, wherein the composition of the impact-resistant primer consists of a copolymer of acrylic and/or methacrylic monomers and of aromatic vinyl compounds.

10 10. Lens according to claim 1, wherein the composition of the impact-resistant primer consists of a polysiloxane.

11. Lens according to claim 10, wherein the composition of the impact-resistant primer contains, in a solvent medium, one or a number 10 of silane hydrolysate(s) with an epoxy group containing at least one Si-alkyl group and containing no fillers.

12. Lens according to claim 1, wherein the hard abrasion-resistant coating is obtained by curing a composition containing:

15 a) colloidal silica which has a mean particle diameter of between 1 and 100 μm ;
 b) a solvent;
 c) a hydrolysate or a mixture of hydrolysates of silane compound(s) of formula:



25 in which:

R^1 denotes an organic group containing an epoxy group;

R^2 is a hydrocarbon radical which has 1 or 2 carbon atoms;

R^3 is a hydrocarbon group which has from 1 to 4 carbon atoms, and α is 0 or 1 in value.

30 13. Lens according to claim 1, wherein the thickness of the abrasion-resistant layer, in the cured state, is between 1 and 15 μm .

14. Lens according to claim 12, wherein the composition of the abrasive-resistant costing has a colloidal silica content of between 0 and 40% by weight in the solids content.

15. Lens according to claim 1, wherein the anti-reflective coating consists of a mono- or multilayer film based on dielectric materials and deposited by vacuum deposition.

16. Lens according to claim 1, successively including :

5 a) a substrate made of glass obtained by polymerization of diethylene glycol bis(allyl carbonate);

b) a hard abrasion-resistant coating obtained by curing a composition containing, in methanol, colloidal silica and a hydrolysate of γ -glycidyloxypropylmethyldiethoxysilane;

10 c) an impact-resistant interlayer obtained by curing a composition containing, in methanol, a hydrolysate of γ -glycidyloxypropylmethyldiethoxysilane or of γ -glycidoxypropyltrimethoxysilane;

d) a multilayer anti-reflective coating.

15 17. Lens according to claim 1, successively including :

a) a substrate made of glass obtained by polymerization of diethylene glycol bis (allyl carbonate);

b) an abrasion-resistant coating obtained by curing a composition containing, in methanol, colloidal silica and a hydrolysate of γ -glycidoxypropylmethyldiethoxysilane;

20 c) an impact-resistant interlayer obtained by 35 curing a composition containing 4,4'-dicyclohexylmethane diisocyanate and polyethylene glycol;

d) a multilayer anti-reflective coating.

25 18. Process for the manufacture of an ophthalmic lens as defined in claim 1, comprising :

- applying the abrasion-resistant coating onto the surface of the organic glass substrate,

- depositing the layer of impact-resistant primer is deposited onto the abrasion-resistant layer ; and

30 - depositing the anti-reflective coating is onto the impact-resistant primer.

19. Process according to claim 18, wherein the abrasion-resistant layer and the layer of impact-resistant primer are deposited by

centrifuging, by dipping or by spraying and in that the anti-reflective coating is applied by vacuum deposition or sol-gel deposition.

20. Process according to claim 18, wherein the abrasion-resistant and impact-resistant primer layers are pretreated using a surface 5 activation treatment by a chemical or physical route.

21. Process according to claim 20, wherein the surface activation treatment is an alkaline chemical etching, an oxygen plasma treatment or an ion bombardment in a vacuum vessel.